

REMARKS

In the outstanding Official Action, the Examiner rejected claims 1-10 under 35 USC 102(b) as being anticipated by Pecorari.

In response, Applicants respectfully traverse the rejection of claim 1-10 under 35 USC 103(a) as being unpatentable over Pecorari. Reconsideration is respectfully requested.

Independent claim 1 comprises a device for the rotatable coupling of two coaxial connection elements in which a gap between a housing part and an outer circumference of the toothed connection element and a gap underneath the rolling bearing are each closed by sealing rings, which are secured to opposite circumferences of the toothed connection element, and are pressed by their inherent elasticity in an axial direction against a lower front end of a cylindrical casing-shaped housing part and against a lower front end of the untoothed connection element; and the housing part and sealing rings protecting a lubricant grease against impurities.

Applicants believe that Pecorari discloses a rotatable coupling having a crown, a toothed element, securement means, and connection elements. Applicants further believe that Pecorari discloses a coupling having sealing rings fixed to the outer element of a gap, these sealing rings are pressed in a radial direction against an inner element across from the gap, and oil is used for lubrication therein.

Applicants believe that the present invention of claim 1 and Pecorari have significant differences with respect to lubricant and types of seals. Applicants further believe that the use of oil as a lubricant and the radial seals of Pecorari teach away from the use of grease as a lubricant and the axial seals of the present invention.

There are significant advantages for using grease instead of oil. Gearings for heavy duty applications have to carry substantial weight, including, for example, cranes, vehicle lifts, etc. The substantial weight leads to deformation of the ball bearings, which in turn cause the two rings of such a gearing to tilt with respect to each other. Because of these movements, a sealing will never be 100% tight. Applicants believe that this causes the gear disclosed by Pecorari to leak slowly, but permanently, even with a very good sealing. After some time, the gearing will run dry and be destroyed. Such damage will not only occur upon an entire loss of lubrication oil, but even when part of the gearing where the teeth of two elements mesh with each other lies above the oil level. Significant damage may occur if the gearing is in an inclined position, with some elements engaged together in the upper region of the gearing, and some oil is lost. A loss of as little as 10% of the volume of oil may cause damage. Therefore, there is no definitive maintenance interval.

Additionally, grease has wetting properties and adheres at the surfaces of all gearing parts; therefore it has very good emergency running quality, even if as significant amount, i.e. 90%, of the lubricant has been lost.

Some heavy duty gearings with low height are provided with no casing surrounding the toothed ring and are lubricated by grease. Compared to this, the present invention leads to a longer maintenance interval than these open gearings, while Pecorari is believed to lead to a shorter maintenance interval. In this regard, oil is not equivalent to grease.

Applicants believe that Pecorari discloses the use of oil to overcome problems encountered at the state of the art. (See

Pecorari at column 1, lines 33 to 37). Pecorari states that "the need to grease is eliminated...because the worm and gear constantly have an oil film between them." Accordingly, Pecorari specifically teaches away from the use of grease as the lubricant and, therefore, the use of grease and oil are not equivalent with respect to Pecorari.

Applicants believe that Pecorari discloses the use of a special kind of sealing called "radial packing ring", "ring and expander" or "oil seal" to keep oil inside of the housing. These sealings are more expensive than normal sealings.

Further, such sealings do not have any axial bias inasmuch as there is no surface on a lower end against which an axial bias could be applied on the "radial packing ring" as it is pressed in a radial direction instead of an axial direction. This type of sealing ring is not supported by a horizontal surface of any other part. Applicants believe that Pecorari may allow dirt or other particles pressed against the sealing to push the radial packing ring away and open the sealing. This will cause the dirt to move inside and the oil to flow out.

In contrast, if dirt or other particles are pressed against the sealing ring of the present invention, the sealing ring is pressed against the lower end of the other ring and becomes tighter. Dirt is not allowed to enter inside. Accordingly, independent claim 1 is believed to be in condition for allowance, and allowance thereof is respectfully requested.

Claims 2-10, which depend either directly or ultimately from independent claim 1, are believed to be in condition for allowance at least for the above-identified reasons. Accordingly, allowance of claims 2-10 is respectfully requested.

Applicants have now amended the specification at page 25, line 33, to insert -- means -- between "lubricant" and "88". Fig. 4 illustrates the entrance at reference numeral 88 where lubricant is introduced. No new matter is being added.

If any additional fees are required to be paid in connection with this matter, please charge the same, or credit any overpayment, to Deposit Account No. 16-0221.

Respectfully submitted,

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